Claims

1. (Currently amended) An imaging apparatus, comprising:

an electromagnetic pulse source;

a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion;

an X-ray source generating a beam in response to the first pulse portion, the beam directed toward an object for generating an X-ray object image; and

~~a time gate~~ an X-ray time gate capturing the X-ray object image in response to the second pulse portion.

2. (Original) The apparatus of claim 1 wherein the electromagnetic pulse source comprises a laser.

3. (Previously presented) The apparatus of claim 2 wherein the laser produces a pulse having a width of about 10 – 30 femtoseconds and an energy of at least 125 – 250 mJ at a rate of about 100 – 250 pulses per second.

4. (Original) The apparatus of claim 1 wherein the X-ray source comprises a laser-produced-plasma X-ray source.

5. (Original) The apparatus of claim 1 wherein the X-ray source comprises a molybdenum target.

6. (Currently amended) The apparatus of claim 1 wherein the X-ray time gate comprises a film that exhibits electromagnetically induced transparency (EIT) in response to the second pulse portion ~~microchannel plate detector~~.

7. (Currently amended) The apparatus of claim 1 including an adjustable delay through which the second pulse portion travels to reach the X-ray time gate.

8. (Currently amended) The apparatus of claim 1 wherein the X-ray time gate comprises a Raman amplifier and the apparatus includes:

a Raman generator receiving the X-ray beam from the X-ray source and generating in response an imaging beam directed toward the object for generating an object image; and

a beam combiner combining the second pulse portion with the object image into a combined beam directed to the Raman amplifier, the amplifier responsive to the second pulse portion to capture the object image.

9. (Original) The apparatus of claim 8 including an adjustable delay through which the second pulse portion travels to reach the beam combiner.

10. (Currently amended) A method for producing an image of an object, comprising:

generating an electromagnetic pulse;

splitting the pulse into a first portion and a second portion;

generating an X-ray beam in response to the first pulse portion, the beam directed toward an object for generating an X-ray object image; and

~~capturing~~ selectively transmitting the X-ray object image in response to the second pulse portion.

11. (Original) The method of claim 10 wherein generating an X-ray beam in response to the first pulse portion includes applying the first pulse portion to an X-ray source that in response generates the X-ray beam.

12. (Currently amended) The method of claim 10 wherein ~~capturing the object image~~ selectively transmitting the X-ray object image in response to the second pulse portion includes applying the second pulse portion to ~~a time gate~~ an X-ray time gate ~~that in response captures the object image~~.

13. (Currently amended) The method of claim 10 wherein the object image is ~~captured~~ transmitted by ~~a time gate~~ an X-ray time gate, the method including combining the object image and the second pulse portion ~~prior to arrival~~ at the X-ray time gate.

14. (Currently amended) The method of claim ~~10including~~ 10 including generating an imaging beam with a Raman generator in response to the X-ray beam, the imaging beam directed toward an object for generating an object image

15. (Original) The method of claim 10 wherein the object for which an image is generated is human tissue.

16. (Original) The method of claim 10 including, after capturing a first object image:
administering a contrast agent to the object;
capturing a second object image; and
comparing the first and second captured object images.

17. (Original) The method of claim 16 wherein the comparing includes subtracting or dividing the pixels of one object image from the pixels of the other object image.

18. (Currently amended) An imaging apparatus, comprising:
an electromagnetic pulse source;
a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion, the first pulse portion directed toward an object for generating an object image; ~~and~~
a microchannel plate detector; and
a film of gating material exhibiting electromagnetically-induced transparency (EIT) and situated to transmit ~~capturing~~ the object image to the microchannel plate detector in response to the second pulse portion.

19. (Original) The apparatus of claim 18 wherein the electromagnetic pulse source comprises a laser.

20. (Original) The imaging apparatus of claim 19 including a second electromagnetic pulse source between the beam splitter and the object, the second pulse source generating in response to the first pulse portion an imaging beam directed toward the object for generating an object image.

21. (Cancelled)

22. (Currently amended) The apparatus of claim 18 including an adjustable delay through which the second pulse portion travels to reach ~~the microchannel plate detector~~ the film of gating material.

23. (Currently amended) A method of producing an image, comprising:

generating an electromagnetic pulse;

splitting the pulse into a first portion and a second portion;

generating an imaging beam in response to the first pulse portion, the imaging beam directed toward an object for generating an object image; and

capturing the object image at a microchannel plate detector using electromagnetically-induced transparency in response to the second pulse portion.

24. (Original) The method of claim 23 wherein generating an image beam in response to the first pulse portion includes applying the first pulse portion to an X-ray source.

25. (Original) The method of claim 23 wherein capturing the object image in response to the second pulse portion includes applying the second pulse portion to the microchannel plate detector that in response captures an instance of the object image incident on the detector.

26. (Original) The method of claim 23 including combining the object image and the second pulse portion prior to arrival at the microchannel plate detector.

27. (New) An X-ray radar apparatus, comprising:

an electromagnetic pulse source;

a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion;

an X-ray source generating a beam in response to the first pulse portion, the beam directed toward an object for generating a reflective X-ray object image; and

an X-ray time gate capturing the reflective X-ray object image in response to the second pulse portion.

28. (New) The apparatus of claim 27, wherein the X-ray time gate comprises a film of gating material exhibiting electromagnetically-induced transparency (EIT) in response to the second pulse portion.

29. (New) The apparatus of claim 27, further comprising a delay path, wherein the second pulse portion travels through the delay path to arrive at the X-ray time gate.

30. (New) The apparatus of claim 29, wherein the delay path is adjustable such that the X-ray time gate captures the reflective X-ray object image associated with a selected object depth.

31. (New) The apparatus of claim 27, wherein the laser produces a pulse having a width of about 10 – 30 femtoseconds and an energy of at least 125 – 250 mJ at a rate of about 100 – 250 pulses per second.

32. (New) The apparatus of claim 27, wherein the X-ray source comprises a laser-produced-plasma X-ray source.

33. (New) A method for examining an object using an X-ray beam, comprising:

generating an electromagnetic pulse;

splitting the pulse into a first portion and a second portion;

generating the X-ray beam using the first pulse portion;

directing the X-ray beam toward an object; and

capturing a reflective X-ray object image associated with a selected object depth with an X-ray time gate that is responsive to the second pulse portion.

34. (New) The method of claim 33, wherein selectively capturing the reflective X-ray object image comprises selectively delaying the second pulse portion based on the selected object depth.

35. (New) The method of claim 33, wherein the X-ray time gate selectively transmits the reflective X-ray object image in response to the second pulse portion.

36. (New) The method of claim 33, wherein the X-ray time gate selectively amplifies the reflective X-ray object image in response to the second pulse portion.

37. (New) The method of claim 33, further comprising:

defining at least a first selected object depth and a second selected object depth; and

capturing a first reflective X-ray object image and a second reflective X-ray object image associated with the first selected object depth and the second selected object depth, respectively.

38. (New) The method of claim 37, further comprising storing the first reflective X-ray object image and the second reflective X-ray object image.